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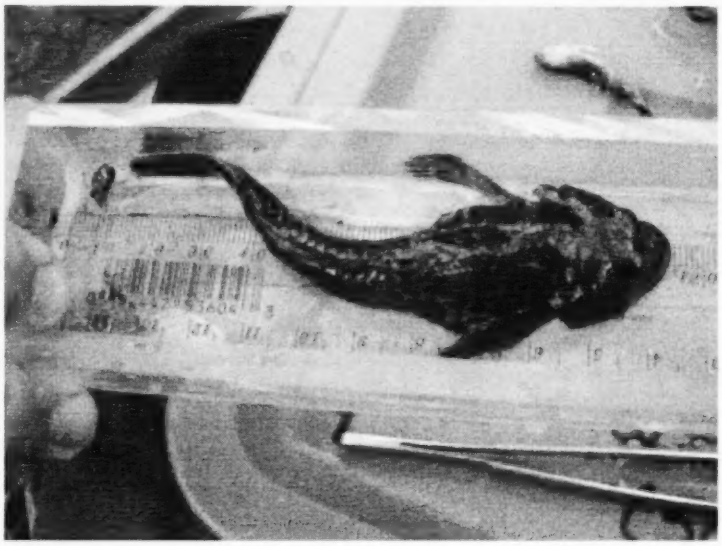
Slimy sculpin stick close to home

by Claire Eamer

The Yukon's slimy sculpin spend most of their short lives hiding in gravel at the bottoms of streams and lakes throughout the territory. And with a name like that, who can blame them?

The name, however, creates an unnecessarily bad impression of the tiny fish, says University of New Brunswick researcher Sandra Brasfield, a self-confessed fan of the slimy sculpin.



At about 10 centimetres, this is a trophy-size slimy sculpin. (photo: S. Brasfield)

"They are actually quite beautiful, with their relatively large heads and eyes and very large fins."

Moreover, they are no more slimy than other fish, she says. Most fish have a protective layer of mucus, and some have much more mucus than the slimy sculpin.

"There are certainly much slimier fish. Just ask anyone who has ever tried to hold an eel or hagfish."

Despite their secretive habits, slimy sculpin are attracting growing attention from scientists as a "sentinel species" -- a species that provides reliable information about the nature and quality of its aquatic habitat.

A couple of qualities make them particularly useful for environmental monitoring.

First, slimy sculpin are extremely widespread. They can be found in Siberia, across northern North America from Alaska to New Brunswick, and across most of Canada and the northern United States.

Second, they don't move around much. Larger fish can swim many kilometres in search of food or more suitable habitat, but slimy sculpin appear to spend their lives, from egg to adult, in the same small territory within a single stream or lake.

That makes them reliable indicators of conditions in particular locations, explains Brasfield.

"Where we catch them is where they live. So if we collect these fish downstream of a sewage treatment outflow, we can be confident they 'live' there and can accurately reflect local conditions."

Slimy sculpin cope well with cold climates like the Yukon's, and they do it in an unusual way. Since growing eggs takes a lot of energy, most northern fish prepare for spawning in the fall, when food is plentiful. Female slimy sculpin wait until late winter and early spring, when streams are still frozen over.

"So this means in a relatively harsh environment, when water temperatures are at their lowest, food is scarce, female sculpin are actively growing eggs," says Brasfield.

She and other researchers are trying to find out how the sculpin find the resources to use this strategy and why it works for them. Brasfield says a female sculpin full of eggs is a tasty morsel for a trout or pike, and speculates that delaying the development of eggs until the spring might reduce the female's risk of being eaten in the winter.

"A pre-spawning female sculpin kind of looks like a tadpole," says Brasfield. "She's just a square box full of eggs."

Once the ice breaks up, the females accelerate egg development while the males prepare nest sites under rocks. In late spring, the males coax females into their nests to lay the eggs -- anywhere from about a hundred to over a thousand.

After the eggs are laid and attached to the underside of rocks in the nest, the male guards the nest until the eggs hatch and the tiny fry disperse into the stream.

The fry eat insect larvae and other small organisms among the rocks of the stream bottom, graduating to larger larvae and other invertebrates, and even small fish, as their mouths get bigger. Sculpin are a food source themselves for larger fish like trout, pike, and salmon, and possibly also for birds that feed in streams and along lakeshores.

Sculpin live about five years and generally reach about 2 to 10 centimetres in length, although a few relative giants might measure up to 14 centimetres.

"How big they are depends on the warmth of the stream," says Brasfield.

In the Yukon, slimy sculpin are found in all major river systems, including in streams too small for the adults of most other fish species.

According to a report by Whitehorse fish biologist Al von Finster, the slimy sculpin is one of the few Yukon fish species that does not migrate with the seasons.

"The presence of large numbers of sculpins, of all age classes, in a stream is considered powerful evidence of winter flows of consistently sufficient water quality and quantity to support fish," he wrote.

For more information about slimy sculpin and other fish species in Yukon waters, see von Finster's report at www.pac.dfo-mpo.gc.ca/yukon/habitatevergpaper.htm.

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